

# THE SATURDAY MAGAZINE.

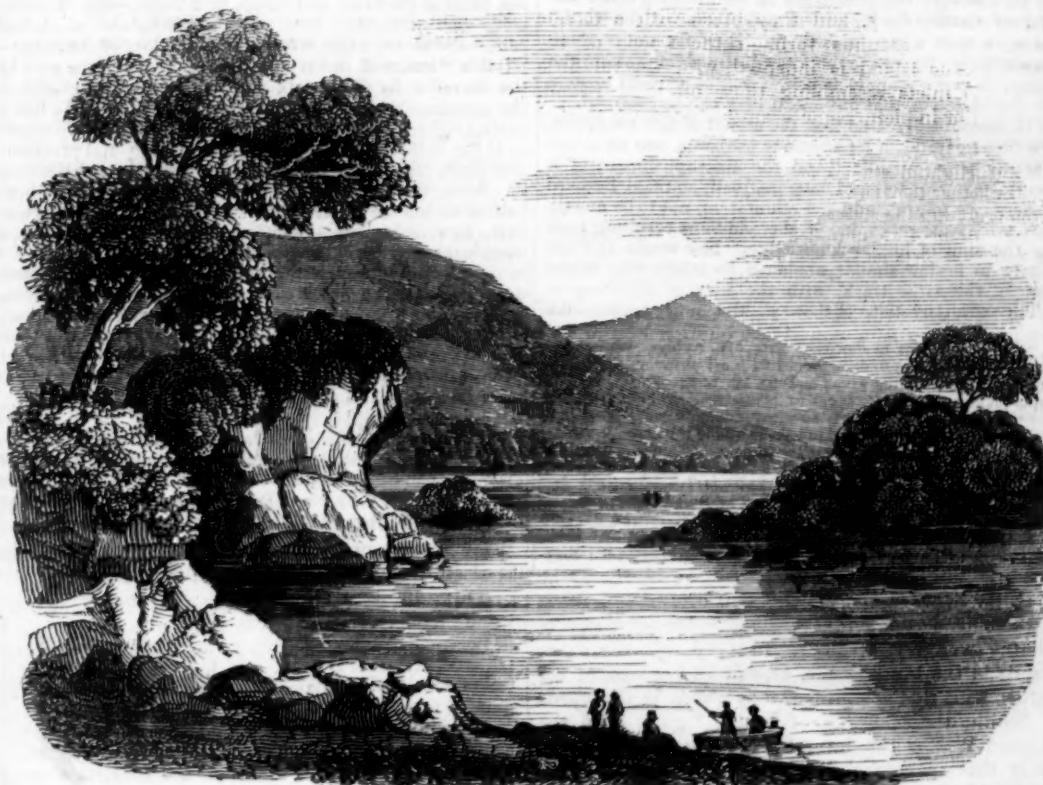
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DECEMBER

2<sup>nd</sup>, 1837.

PRICE  
ONE PENNY.

KILLARNEY. No. V.



[Ross Island.]

[Tomies Mountain.]

[Innisfallen Island.]

VIEW ON THE LOWER LAKE.

## THE ISLE OF INNISFALLEN.

So sweet and pleasant to the eye,  
That it would tempt a man to touchen there.

OF the many islands which lie scattered over the surface of the Lower Lake at Killarney, the largest, Ross Island, has been already described \*. We now proceed to notice the isle of Innisfallen, which ranks next to that of Ross in size, but far surpasses it in that quiet beauty, which, to some persons, constitutes the great charm of the scenery of Killarney.

We have described Ross Island as stretching out to a considerable distance from the western shore of the lake. Innisfallen lies beyond Ross, from which it is separated by the channel represented in our engraving. It is thus placed nearly in the middle of the lake; on the one side it looks upon the bold rocky shores of Ross, while, upon the other, the view is uninterrupted across the noble expanse of water, to the lofty mountains which bound the lake upon the west. When seen from a short distance, the island appears to be entirely covered with an impervious wood; the lofty trees which line the shore, form a screen impenetrable to the eye. Within, however, the surface is spread out into natural lawns, diversified with clumps of trees and masses of gray rock.

From these delightful openings, the blue tops of the mountains on the south side of the lake are beheld towering above the surrounding woods; whilst between the boles of the trees the water appears sparkling below, and occasionally is seen a reach of the distant shore. In the disposition of these grounds the hand of art can only be traced in forming a shrubbery among the rocks, and surrounding the isle with a gravel walk under the tall trees.

From whatever side it be approached, the view which Innisfallen affords, is of a totally different character from that of any other island on that lake. It impresses the visitor with an idea of luxuriance, comfort, and tranquillity; in some parts, the ground is clothed in the brightest verdure, while in others is displayed, in the greatest variety, the rich foliage of trees and shrubs, all flourishing exuberantly.

Groups of lofty oaks (says Mr. Wright,) sling their arms over the sward beneath, and the intervals between them are generally occupied by various shrubs, so that only an occasional glimpse is permitted through the woods of the lake and distant mountains; occasional openings are left, where the richest imaginable pasture is unfolded, beautified by an undulating surface, and embosomed in sylvan scenery. In walking round the island, the variety to be met with in so small a compass, almost exceeds belief, and delights the admirer of the soft, the beautiful, and the gentle in nature, to ecstasy. Here a forest scene, in whose centre stands the royal oak; a little further, trees of less commanding, but not less beautiful aspect, present themselves.

\* See Saturday Magazine, Vol. XI., p. 193.

On the side looking towards Ross Island, the shores of Innisfallen are low and shelving, and the water very shallow, as the numerous rounded black stones which appear above the surface at a considerable distance from the land, indicate. The opposite side of the island, or that which opens upon the middle of the lake, exhibits a totally different character, presenting a barrier of bold rocks which rise perpendicularly from the water, to the height of twenty feet. In tempestuous weather, "immense billows are rolled from the great body of the lake against these rocks, and they break with a terrific noise, which resounds through the woods of the island." The island is indented with several little coves and inlets resembling those of Ross Island, but superior in picturesque beauty from being skirted with lofty trees.

More delightful studies for the pencil are scarcely to be found, whether they be viewed under the influence of the storm, or during the stillness of a Summer's evening, when the lake presents an unruffled surface, and the images of the various objects on the shore appear—

Smooth, glossed, and softened, in the mirror's breast.

The oak, the ash, the alder, the holly, both bald and prickly, grow in abundance on this island, and attain a much larger size than in any part of the neighbouring shores. In one part of the island a holly is shown, the circumference of whose stem measures fourteen feet; in another place a large hawthorn has made its way completely through the centre of a monumental stone in the vicinity of the old abbey. At the most remote extremity of the island, a projecting rock overshadowed by an aged yew, is designated the "Bed of Honour," in commemoration of a visit paid to the spot by the Duke of Rutland, when Lord Lieutenant of Ireland. One of the chief beauties of the island is the profusion of arbutus which it displays. Indeed, all the other islands in the Lower Lake, as well as Innisfallen, are clothed with this beautiful shrub, which, in the words of Smith, the historian of Kerry, "gives even the haggard Winter the beautiful appearance of Spring, for in that melancholy season this tree puts on its highest bloom; which rarely growing in other places, is the more admired by strangers in this."

This tree (says the same writer,) is extremely agreeable in every different circumstance of vegetation, for it hath at one and the same time ripe and green fruit upon its branches, which, as they approach to ripeness, from green become yellow, and at length terminate in a fine scarlet colour, resembling in form a field strawberry, though in size that of the best garden kind. The blossoms grow in clusters of small white bells, not unlike those of the lily of the valley; and in such great abundance, as in that respect alone to be equal in beauty to the *Laurustinus*, and in other respects much superior to it: for the agreeable verdure of the leaves, not much unlike the bay, the scarlet hue of the tender part of the stalk, and all the different stages of vegetation, at one and the same time, from the knitting fruit to perfect ripeness, cannot but be exceedingly agreeable to the curious observer.

The shrub here described is the most remarkable species of the arbutus kind; it is the arbutus of Virgil, called by botanists the *Arbutus unedo*, or the strawberry tree, on account of the resemblance which its berries bear to that fruit. It is a native of the south of Europe; in our gardens it has proved a hardy evergreen. The specimens at Killarney are always considered the most interesting that are found in the British Islands; indeed, from the luxuriance in which it there flourishes, the plant has been sometimes considered, though without sufficient reason, to be indigenous to Ireland.

The soil of the island has long been celebrated for

its exuberance, and the natural herbage has the reputation of possessing an extraordinary power of fattening cattle, insomuch that its excellence has become proverbial throughout the country. Smith, whom we have already quoted, says, "It yields so great a profusion of sweet herbage, that the kine which are put into it to fatten, thrive so prodigiously that their fat becomes a kind of rich marrow in a very short time. The more fleshy parts are in a manner marbled with fat, but their tallow is too soft to make candles, though it is proper enough for soap." Bush, in his *Hibernia Curiosa*, asserts that "the fat of a beast in a few weeks, feeding on the herbage of Innisfallen, will be converted into a species of very marrow, even too rich for the chandler's use, without a mixture of a grosser kind." This statement of the older writers may be exaggerated; but the fact is certain that the island affords excellent pasture.

Mr. Weld remarks that one would think that the recollection of Innisfallen was fresh in the memory of the poet Spenser, when he drew the description of the island in his *Idle Lake*:

It was a chosen plott of fertile land  
Emongst wide waves sett like a little nest;  
As if it had by Nature's cunning hand  
Bene choycely picked out from all the rest  
And laid forth for ensample of the best.

It is, indeed, generally admitted that Spenser was indebted for much of his imagery to the rich and romantic scenes of the south of Ireland. Kilcolman Castle, where he resided whilst engaged in the composition of his *Faerie Queen*, is distant from the Lake of Killarney not more than one day's easy journey; it may be presumed, therefore, that such an attractive spot did not escape the attention of the poet.

Of the isle of Innisfallen, (says Arthur Young,) it is paying no great compliment to say, it is the most beautiful in the king's dominions, and, perhaps, in Europe. It contains twenty acres of land, and has every variety that the range of beauty, unmixed with the sublime, can give. The general feature is that of wood; the surface undulates into swelling hills and sinks into little vales; the slopes are in every direction, the declivities die gently away, forming those slight inequalities which are the greatest beauty of dressed grounds. The little valleys let in views of the surrounding lake between the hills, while the swells break the regular outline of the water, and give to the whole an agreeable confusion. The wood has all the variety into which nature has thrown the surface; in sofe parts it is so thick as to appear impenetrable, and secludes all further view; in others it breaks into tufts of tall timber under which cattle feed. Here they open as if to offer to the spectator the view of the naked lawn; in others close, as if purposely to forbid a more prying examination. Trees of large size and commanding figure, form in some places natural arches; the ivy mixing with the branches and hanging across in festoons of foliage, while on one side the lake glitters among the trees, and on the other a thick gloom dwells in the recesses of the wood. The figure of the island renders one part a beautiful object to another; for the coast being broken and indented, forms bays surrounded either by rock or wood: slight promontories shoot into the lake, whose rocky edges are crowned with wood.

Apart, however, from its natural beauties, the island of Innisfallen is deserving of notice on account of the flourishing abbey which it formerly possessed, and of which the scanty remains still contribute to its picturesque attractions at the present day. At an early period after the introduction of Christianity into Ireland, the peaceful and retired situation of this spot attracted the attention of the monks; and towards the close of the sixth century, an abbey was founded here by St. Finian Lobhar, or the Leper, a son of Alild, King of Munster, and a disciple of Brenden. In the year 640, St. Dichall, the son of Nessian, was abbot; and from the circumstance of

that saint, together with his two brothers, being held in great veneration by the votaries, the island acquired the name of Innis-Nessan, or Innis-Mac-Nessan, that is to say, the island of the sons of Nessan. This name, however, afterwards gave way to the more significant appellation of Innisfallen, "the beautiful or healthy island," by which it is now commonly known, and Innisfaithlenn, "the island in the beautiful lake," which it bore some time ago.

One of the oldest and most remarkable among the Irish manuscripts of a later date which have been handed down to us, is a chronicle often cited by antiquaries, under the title of Annals of Innisfallen, the principal part of which was the work of a monk of the abbey who died about the year 1215. They contain a short sketch of universal history, from the creation of the world to the year 430 A.D., or thereabouts; but from that period the affairs of Ireland are more particularly treated of by the annalist down to his own times. A continuation to the year 1320 was afterwards added by another person.

Among the notices relating to the abbey in these Annals of Innisfallen, is the following passage, which serves to illustrate the condition of Ireland at the period in question:—

"1180. This abbey being ever esteemed a paradise and a secure sanctuary, the treasure and most valuable effects of the whole country were deposited in the hands of its clergy; notwithstanding which, we find the abbey was plundered in this year by Maolduin, son of Daniel O'Donaghoe, many of the clergy were slain, and even in their cemetery, by the McCarthys; but God soon punished this act of impiety and sacrilege by bringing many of its authors to an untimely end."

. There occurs, also, the following notice of the death of a superior:—

"1197. On the 19th of December died Gilla Patrick O'Huihair, in the seventy-ninth year of his age; he was archdeacon of Faithlin, superior of this convent, and the founder of many religious houses, to all of which he presented books, vestments, and all other necessary furniture: he was a celebrated poet, and was in the highest estimation for his chaste life, piety, wisdom, and universal charity."

In the reign of Elizabeth, the monks were dispossessed of the abbey of Innisfallen, which, together with its lands, and certain church patronage, was granted to Robert Collam,—the same individual who received the abbey of Irrelagh or Mucruss\*. It is supposed, however, that the abbey of Innisfallen continued to be inhabited for a long time afterwards by the monks, in like manner as did Mucruss Abbey, which we know to have undergone a repair under the superintendence of one of the brethren, as late as the year 1626.

The remains of the abbey are situated at the north-eastern extremity of the island, nor far from one of the landing-places; they are inconsiderable in extent, and possess scarcely any architectural merit. It is generally thought, and with good reason, that no part of them can have belonged to the original building, and that they must be referred to a later age; but upon this subject nothing certain can be said, as the history of monastic edifices in Ireland is generally involved in impenetrable obscurity.

The abbey-church consisted of a single aisle seventy feet long and twenty feet wide; a few of the windows have been traced, and from their narrowness, the interior of the building, like that of other ancient churches in Ireland, must have been extremely dark. The architecture of the cloister, and of what seem to have been the dwelling apartments of the abbey, is of the rudest kind; no sculptured ornaments, no lofty arches, no spacious windows, are observable.

\* See Saturday Magazine, Vol. XI. p. 123.

Behind the abbey is pointed out the garden, containing some plum trees of great age.

In the opinion of Mr. Weld, the most interesting of all the remains of antiquity at Innisfallen, and the only one which has any claim to picturesque beauty, is a small ivy-covered chapel, or oratory, which stands on a projecting cliff, or mass of rocks, close to the water at the eastern extremity of the island, between the two coves where visitors land. It might be supposed that Spenser had it in mind when he wrote the following lines:—

And nigh thereto a little chappel stode,  
Which being all with yvy overspred,  
Deckt all the roofe, and shadowing the roode,  
Seemed like a grove fair braunched over hed.

The door-case is a Saxon arch, ornamented, and possessing considerable pretensions to beauty; but the soft stone of which it is composed has been unable to resist the inroads of decay. Several years ago, this little edifice was fitted up as a place of entertainment by the owner of Innisfallen, Lord Kenmare; and it has been since generally known by the appellation of the banqueting-house.

In proceeding from the castle through the bay of Ross, towards Innisfallen Island, the boats are usually kept close under the rocky shore of Ross Island, the water being much deeper there than it is at the opposite side of the bay. Several little wooded promontories here overhang the lake, on approaching which the attention of the visitor is continually kept alive by the hope of discovering some new landscape behind them; but no part of the distant scene is revealed to him till he reaches the mouth of the bay, when, on doubling a rocky point, an extensive prospect of the mountains, with a wide expanse of the lake, suddenly burst upon the eye. Our engraving represents this view. The woods on the right are those of Innisfallen Island; the fore-ground a part of the shore of Ross; Mouse Island is seen in the middle channel, and in the distance Tomies Mountain.

As no spot within the confines of Killarney (says Mr. Weld,) possesses more attractions, so none is so much resorted to as Innisfallen: that not only by passing strangers, but by the resident gentry of the country, who, during Summer, frequently give *fêtes champêtres* on the island to large parties of their neighbouring friends. The amusements on these occasions, consist of such as accord with the nature of the place. Some, with a chosen company, put off from the island, and row or sail along the shores, to display their own dexterity, or the superior excellence of their boats, which, decked with their gayest colours, diffuse an air of uncommon cheerfulness over the scene. Some wander through the woods; whilst others, reclined on the rocky beach, find pleasure in contemplating the magnificence of the surrounding landscape; or, perhaps, continue listening to the sound of music "by distance made more sweet." Dancing on the green sod in the mean time, engages the more gay; and often the length of a Summer's day being insufficient to complete the enjoyment, the festive entertainment is protracted through the cool and still hours of the night,—

..... While over head the moon  
Sits arbitress, and nearer to the earth  
Wheels her pale course.

If a visit to Innisfallen happen to be made for the first time under favourable circumstances, when the shores, instead of being crowded by different parties, are seen in all their native simplicity, it seldom fails to inspire, at least for the moment, very enthusiastic feelings on the subject of rural retirement.

WHERE education has been entirely neglected, or improperly managed, we see the worst passions ruling with uncontrolled and incessant sway. Good sense degenerates into craft, and anger rankles into malignity. Restraint, which is thought most salutary, comes too late, and the most judicious admonitions are urged in vain.—PARR.

THE HOUSE I LIVE IN.  
No. IV.



We come now to what we may call the **CUPOLA** of the house. By this term I mean the skull, which is placed on the top of the great post already described. I have already told you that seven of the twenty-four pieces which form that post are situated above the second story of the building, and unite the skull to the trunk. You will observe the vaulted chamber at the upper part, and you may see, also, the places for doors and windows.

I must stop here long enough to say, that—unlike what is seen in ordinary dwellings—the doors and windows of the house I live in are in the cupola: there is not one door in either the first or second story. The windows, and some of the doors, are placed in front—other doors are at the sides. The doors and windows themselves, as you know, properly belong to the covering. They will therefore be described under that head.

I have called the mouth, and ears, and nostrils, by the name of *doors*, in order to keep up the metaphor which pervades these papers; the eyes may, with propriety, be regarded as *windows*. All sound, smell, and taste pass through the passages before mentioned, and the machinery or organs near and within them.

THE CRANUM.

At the top of this paper I have placed a picture of the whole skull. Now if the bones of the face and neck were taken quite away, and nothing left but the hollow brain-case, (the *cranium*,) the appearance would be very different. Here is a view of the frontal bone, from which the other bones have been removed.



You see, in front, the upper part of the cavity or socket for each of the two eyes; and on one side, the place where the ear would be in the living person. This brain-case is composed of eight bones, most of which are closely united by a rough edge, like that of a saw, the notches of which shut into each other as the teeth of a saw would do, and form what may be called *seams*. These seams are by anatomists called *sutures*, and are nine or ten in number, of different lengths, according to the size of the bones which they separate. They are said to be of use in limiting the extent of fractures of the skull, and in some diseases of the brain; and doubtless, like everything else which has been formed by the beneficent hand of the Creator, they perform some important part in the great economy of nature.

One of the most important bones of the skull, or brain pan, is that which stretches across the whole

forehead, and is called the *os frontis*, or frontal bone. Another across the back of the skull, and of a somewhat triangular shape, is the *os occipitis*, the pointed extremity of which reaches to the crown of the head. Another piece, shaped a little like a clam-shell, lies around each ear; this is the *os temporis*, and there are of course two of them, one on each side. On the upper sides of the head, surrounded by those already described, are the two *parietal* bones. At the bottom of the skull, and wedging in and locking together nearly all the bones of the head and face, lies the *os sphenoides*. This is in shape something like a bat with extended wings, and has attachment to fourteen distinct bones. The *os ethmoides*, so called from its resemblance to a sieve, being perforated with a great number of holes, for the transmission of the power of smell, lies at the root of the nose, joining the bones of the face to those of the head properly so called.

The whole space within the cranium is filled with brain, which in an adult weighs from two and a half to three pounds and a quarter; in some instances it has been found somewhat larger. The bones of the skull—more especially of the lower part—are so irregular in shape, and so grotesque, it may be said, in their arrangements, as to defy description. In truth, throughout the whole body, there is not so complicated and difficult a study as the anatomy of the head. Of its great importance you will be aware, when I remind you that all the *senses* are more or less connected with the healthy performance of its functions.

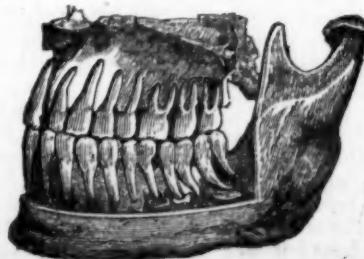
There are six bones on each side, which form the face, and are grouped together under the common name of the *upper* jaw. Each of these bones, like those of the skull, have names assigned to them, and, like them, also, have *sutures* at their uniting parts.

The lower jaw is one strong bone, which has been compared to a horse-shoe, or a crescent. Both the upper and lower jaws serve for the attachment of very powerful muscles, which are concerned in the business of mastication.

THE TEETH.

Around one of the doors of the cupola, and by far the largest of the whole, is a most remarkable arrangement, which requires a particular description. There is here a slight resemblance to a wheel with its component parts, or cogs.

There are, however, no wheels, but there is something like a mill, and an operation similar to grinding is performed; the motion by which this grinding is effected, is very much like that of a pestle and mortar. One of the segments of a wheel, with its cogs, remains still during the operation, while the other moves up and down upon it, and breaks in pieces the substances which are interposed. In addition to this motion, there is a sliding from side to side which takes place, and thus the process of grinding is complete. This cut represents the left side of part of the bones of the human face, as it would appear, if the outside of both the upper and lower jaw were taken away.



By this view you will perceive that the upper row of teeth, and the corresponding jaw, form the wheel and its cogs which remains still; while the moving wheel, which bruises the food submitted to its operation, is the lower jaw, and the teeth contained in it, the articular surface of which moves very freely in a depression at the base of the skull, beneath the ear.

When the number of teeth is complete in an adult, none having been lost or drawn out, each jaw contains sixteen; and both together, of course, hold thirty-two. In the engraving, you see there are eight teeth above and eight below; that is, just half of the whole. Children have but twenty teeth at first, or ten in each jaw. These twenty are sometimes called the milk teeth, because they appear while the child's principal food is milk. These are gradually shed, between the ages of seven and fourteen years; and thirty-two new ones grow in their places.

There is a period in every child's life—say at about the age of six years—when, if it have not yet begun to shed its first set of teeth, there are forty-eight in both jaws; twenty in sight, and twenty-eight beneath them, lying deep at the roots of the former.

There are four kinds of teeth in each jaw, namely, four front teeth, two canine teeth, called also eye teeth, four small grinders, and six large grinders. Of these, half are of course on each side. Those in front have only one root each; the grinders, or double teeth, have two, and sometimes more.

The fore teeth and eye teeth have but one root each. The small grinders do not often have more than one, but they are usually indented lengthwise, so as to give the appearance of two. The large grinders of the lower jaw have two roots, and those of the upper have three—two before and one behind, or on the inside.

The teeth are not set into the jaw-bone itself, although they appear to be so, but into a bony appendage, called the *alveolar process*, which forms the true sockets of the teeth. These sockets, in old age, and when the teeth are no longer contained within them, become absorbed, and are carried away into the mass of circulating fluids by a process yet to be mentioned; hence arises that flatness of the lower jaw, and apparent shrinking of the face, which we observe in elderly persons.

Like the rest of the bones, the teeth consist principally of earthy substance—I mean lime. But at first, children can hardly be said to have bones of any kind. Some have begun to be a little solid, others have not. Where the bones afterwards are, there is at first a piece, or lump, of something which is nearly transparent, and more like jelly than bone. This in time ossifies, that is, becomes solid; and forms bone.

#### GROWTH OF THE TEETH.

The teeth, as well as the other bones, are, at the first, mere pieces of jelly. They do not appear at birth, for they are within the jaw-bone. And what may seem strange, the lumps of jelly-like substance which make both sets of teeth, (those which are shed early and also those which come afterwards in their place,) are there at the same time; one set near the edge of the jaw-bone, for early use, and the other a little deeper within it. The following engraving shows the teeth as they appear in a child, before it has shed many of the first set.

When the soft pieces of jelly which form the teeth become bone, a hard speck commences in the centre of a tooth, which is deposited by the blood-vessels that nourish it, and this gradually growing larger, all the jelly becomes absorbed, and its place occupied by bone. The teeth, however, consist of something else besides bone; if not, they would very soon wear

out. We have, indeed, the sense of feeling in the teeth, and there are blood vessels connected with them.



STRUCTURE OF THE TEETH.

Each tooth consists of three parts—the *crown*, the *neck*, and the *fang*. The fang or root is the part which is set firmly in a socket in the jaw-bone, as if it were driven in like a nail. The neck is close to the edge of the jaw, where the skin or membrane which covers the jaw-bone joins to the tooth and adheres to it. (It is this membrane, as well as the gum, which the dentist separates from the tooth with his lancet, when about to extract it.) The tooth is a little smaller here, like a neck, or as if a cord had been tied tightly around, and indented it. The crown or body of the tooth is that part which we see above the gum.

Now to prevent the teeth from wearing out, as a piece of common bone would do, this crown is coated all over with something much harder than any bone in the human body. It is called *enamel*.

#### BONES OF THE EAR.

About three quarters of an inch within each of the two side doors of the cupola—the ears—is a film or membrane drawn tightly across the passage, like a drum-head. This is called the membrane of the *tympanum*—*tympanum* being the Latin word for drum; and a cavity behind the membrane is, of itself, called the *tympanum*.

In this latter cavity are four small bones; and they are undoubtedly concerned with the sense of hearing. Sounds reach the brain through the passage of the ear; and if there were no ear, we should hear no sound. He who made the ear for sound, made all parts of it for some object; and we must believe that every part of it is useful.



The bone at (a) is called the *malleus*, because it has been supposed to resemble a mallet, or hammer. It is close to the membrane of the *tympanum*, and touches it. The *incus*, or anvil (b), is the next. A little further on is the little ring (c), which seems to connect the *incus* to the stirrup. It is called the *os orbiculare*. *Os* means bone, and *orbiculare* means ring-shaped. The *stapes*, or stirrup (d), is the farthest within the head. This little chain of bones is stretched along in the passage from the outside towards the inside of the head, beginning at the *tympanum*, and ending at a small opening at a considerable distance within the head. They stand in the engraving nearly as they do in the right ear of a person, with the *malleus* outward, and the *stapes* inward towards the brain.

#### BONE OF THE THROAT.

There is a curious little bone inside the neck, near the root of the tongue, called the *hyoides*, or *os hyoides*. It somewhat resembles the Greek letter *v*—*upsilon*. This bone has something to do with keeping in their proper places the parts concerned in speaking, chewing, swallowing, &c.



### THE MECHANICS OF STANDING AND WALKING.

It is usually considered that, in standing, the feet are best placed when they are inclined outwards to the right and left of the body. This is an opinion which, however it may have originated, is perfectly correct. A geometrical consideration of the subject shows that, in this position of the feet, the base on which the body virtually rests, which may be considered to be included by the outside margins of the feet, and by lines joining the extremities of the toes and heels, is larger than when they are placed parallel to one another, and in the direction towards which the face is turned. Thus, if a person placing his heels each in a particular spot, were to turn his feet equally round them to the right and left, and measure the four-sided areas, which in their different positions they would include (with lines joining the toes and heels), he would find that these areas increased continually from the direct and parallel position of the feet up to a certain oblique position, after which they would diminish. This oblique position of the feet, at which the included area is the *greatest*, depends upon the proportion of the length of the foot to the distance of the heels. If the distance of the heels just equal the length of the foot, it is  $30^\circ$ . If the heels be placed close together, it is  $45^\circ$ .

That position of the body would seem to be the most stable in which its base is thus the most extended; and practically, the inclination which gives this most extended base appears from the above to be between these limits of  $30^\circ$  and  $45^\circ$ , being in most cases nearer to the former limit.

When a man walks, his centre of gravity is thrown alternately over one and the other foot; and to effect this transfer, the whole of the upper and weightier part of the body is made to pass alternately from one side to the other.

Of course this is done with the greatest ease when the feet are at the least distance apart, and thus, if his footsteps be examined, their distance *laterally* will be found to be much less when he walks, than when he stands still.

This is peculiarly the case with birds, especially those whose bodies, propped upon long legs, require an extremely accurate adjustment over their feet. If the footsteps of these birds be examined, they will be found nearly in a straight line. A person who has not acquired the habit of thus placing his feet, as he walks, *before* one another, but steps with them *apart*, must, in order to transfer the centre of gravity from over one foot to over the other, sensibly incline his body, first to the right hand and then to the left: he is then said to *waddle* as he walks, or to have a *shuffling* gait.

Now, let it be considered how delicate is the adjustment by which the centre of gravity of the whole body is brought over a single foot.

The width of a man's foot may average, in the widest part, from three inches to three inches and a half, so that when brought over the centre of the width, the foot, the centre of gravity is distant about an inch and a half from either side. This being the case, it may be calculated that an inclination of less than two degrees would be sufficient to bring the centre of gravity of a tall man, when he stands upon one foot, beyond the limits of his foot, and thus to overthrow the whole body, unless some alteration were made in the distribution of its parts, so as to bring it again into a position of stability.

Thus, in taking every step, the slightest inclination of the body beyond its right inclination, would be sufficient to cause a fall, unless it were accompanied

by some new adjustment of the whole system,—some new position of the whole of the upper portion of the body, adjusted and proportioned to the required alteration in the position of the centre of gravity.

And yet how steadily and how firmly does a man walk, and under what an infinite variety of circumstances, however rough and uneven may be his road, or however inclined the surface on which he treads!

Place a load upon his head, as heavy at least as himself, and such as will raise the centre of gravity of the whole system which he has to support, from its average height of about four feet to five feet. An inclination sideways of about *one-half a degree* would then be sufficient to cause him, as he walks along, to fall over on his side; yet how rarely do the porters in our crowded streets meet with an accident.

One of the most remarkable features of walking is the alternate swinging of the arms, by which it is always in a greater or less degree accompanied. This motion of the arms is of the nature of an oscillation: it is occasioned by the alternate carrying forwards of their points of suspension,—the shoulders. It may be thus illustrated:—If, holding a weight, suspended from a string of a foot or two in length, we suddenly carry forwards the hand from which it is suspended, the weight will be left behind some distance, out of the vertical line in which it would naturally hang; and having nothing in that position to support it, will immediately begin to revolve until it reaches that position again, and afterwards oscillate a number of times through that position, until finally it rests. It is precisely thus with the arms: the motion of each leg carries forward its corresponding shoulder,—the point of suspension of its arm; and this being thus displaced, and the arm placed in an inclined position, it revolves to suspend itself again beneath its shoulder, and then oscillates beyond it,—an oscillation which is continually kept up by *continual* displacements of the shoulder. These, moreover, being alternate in respect to the two shoulders, the oscillations of the arms are also alternate; the one commencing (that is, passing through the position of equilibrium), whilst the other is terminating. The arm, whilst thus in a state of oscillation, has a tendency, by reason of its weight and momentum, to carry the body with it. Were the arms, therefore, made thus to oscillate wide apart, or far to the right and left, this tendency would interfere with the efforts which are alternately made to poise the body over the feet. Persons who swing their arms much when they walk, soon, therefore, acquire the habit of swinging them alternately *before* them, the right arm swinging towards the left when a step is in the act of being taken by the left foot, and thus assisting the equilibrium of the body over that foot. This momentum of the arm in oscillation has probably a tendency also to assist the *rise* which the body makes at every step.

If we consider the legs when in the act of making a step to form two sides of a triangle, of which the intervening space on the ground is the base, it is evident that to pass from that step to another the whole body must be raised over the forward foot, as a fulcrum, and supported in the act of revolution by the forward leg. To effect this revolution, the whole body must in each successive step be *raised*; and this continual raising of the body over the fulcrum of the foot, constitutes the great effort of walking. If we assume a yard for the average length of a man's legs, which is probably not far from the truth, and consider that when taking a full step he steps a yard, the triangle which he makes at each such step will be an equilateral triangle, and it may be easily calcu-

lated that in passing from one such step to another, the body must be raised a perpendicular height equal to one-eighth of the length of a step, or one-eighth of a yard; thus, in walking a mile, which is 1760 yards, with such steps as these, the whole body will have been raised, by 1760 successive lifts, no less than 220 yards. In ordinary walking the steps are not, however, a yard in length; the triangle is not an equilateral one, and the angle made by the fork of the legs is not an angle of sixty degrees, as it would in that case be, but perhaps of forty or forty-five degrees. On the first supposition, the whole elevation of the body in walking over any distance will be one-eleventh, and on the other one-tenth of that distance.

If we assume that a man weighing twelve stone walks eleven miles in three hours, and that he can thus walk for eight hours daily, the following comparison may be made between his effort in doing this, and what is usually called a horse's power. In walking eleven miles, he may be considered to have raised his body, whose weight is 168 lbs., by successive lifts, through a perpendicular height of one-eleventh of that distance, that is, through one mile. This elevation is accomplished in three hours, or, as is easily calculated, at the rate of 29·31 feet per minute. Now the same force which would thus raise twelve stone, or 168 lbs., through 29·31 feet in a minute, would be sufficient to raise a number of pound represented by the product of 168 and 29·31, that is, 4924 lbs., through one foot in a minute. But the power of a strong horse, working eight hours a day, is calculated to be equal to the raising of 32,000 lbs., through one foot in a minute. It is, therefore, according to this calculation, equivalent to the effort of six and a half men walking.

When a man is walking quickly, or running, there is by this act of his motion a certain *force* of motion or momentum, as it is called, communicated to his body, the effect of which is the same as though it all acted through its centre of gravity. If by some obstacle the motion of his feet be suddenly arrested, this force of motion thus acting at his centre of gravity, will cause him to turn over the obstacle, or overthrow him. When, therefore, he wishes to stop, he places himself in such a position, inclining backwards, as will make the weight of his body to act *against* its momentum, or force of motion, which he the more readily does, because this weight of his body produces the same effect as though it, too, as well as the force of motion, were collected at the centre of gravity. And if his position be thus rightly chosen, the weight of his body collected in its centre of gravity will, in order to overthrow him, require to be lifted such a height as the force of his motion collected also there, is not sufficient to lift it. It is in reference to these circumstances that the whole of his attitude in stopping himself is chosen. He leans backwards, and advances his right foot; by both which adjustments of his position, he increases the *height* through which his centre of gravity must be raised before he can be overthrown.

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**ANIMAL** matter, although the most complicated of all natural substances, returns to its elementary state by one spontaneous process, the putrefactive fermentation. By this, the substances forming its different parts are slowly reduced to the state of oxygen, hydrogen, nitrogen, and carbon, and thus the circle of changes through which these principles have passed, is finally completed. Quitting their elementary forms they enter the vegetable system, thence pass to the animal kingdom, and from that they return again to their original simplicity, soon to re-enter the sphere of organized existence.—**MRS. MARCET.**

#### SIR WALTER SCOTT'S VISIT TO MACALLISTER'S CAVE, IN THE ISLE OF SKYE.

QUITTED Loch Scavig, and having doubled its southern cape, opened the bay or salt-water Loch of Sleapin. Then went again on shore (on the Isle of Skye,) to visit the late discovered and much celebrated cavern, called Macallister's Cave. It opens at the end of a deep ravine running upward from the sea, and the proprietor, Mr. Macallister of Strath Aird, finding that visitors injured it, by breaking and carrying away the stalactites with which it abounds, has secured this cavern by an eight or nine feet wall, with a door. Upon inquiring for the key, we found it was three miles up the loch at the laird's house. It was now late, and to stay until a messenger had gone and returned three miles, was not to be thought of, any more than the alternative of going up the loch and lying there all night. We therefore, with regret, resolved to scale the wall, in which attempt, by the assistance of a rope, we easily succeeded. The first entrance to this celebrated cave is rude and unpromising, but the light of the torches with which we were provided, is soon reflected from roof, floor, and walls, which seem as if they were sheeted with marble, partly smooth, partly rough with frost-work and rustic ornaments, and partly wrought into statuary. The floor forms a steep and difficult ascent, and might be fancifully compared to a sheet of water, which, while it rushed whitening and foaming down a declivity, had been suddenly arrested and consolidated by the spell of an enchanter. Upon attaining the summit of this ascent, the cave descends with equal rapidity to the brink of a pool of most limpid water, about four or five yards broad. There opens beyond this pool a portal arch, with beautiful white chasing upon the sides, which promises a continuation of the cave. One of our sailors swam across, for there was no other mode of passing, and informed us (as indeed we partly saw by the light he carried,) that the enchantment of Macallister's Cave terminated with this portal, beyond which there was only a rude ordinary cavern speedily choked with stones and earth. But the pool, on the brink of which we stood, surrounded by the most fanciful mouldings in a substance resembling white marble, and distinguished by the depth and purity of its waters, might be the bathing grotto of a Naiad. I think a statuary might catch beautiful hints from the fanciful and romantic disposition of the stalactites. There is scarce a form or group that an active fancy may not trace among the grotesque ornaments which have been gradually moulded in this cavern by the droppings of the calcareous water, and its hardening into petrifications; many of these have been destroyed by the senseless rage for appropriation among recent tourists, and the grotto has lost (I am informed,) through the smoke of torches, much of that vivid silver tint which was originally one of its chief distinctions. But enough of beauty remains to compensate for all that may be lost. As the easiest mode of return, I slid down the polished sheet of marble which forms the rising ascent. When we left the cave, we carried off two grandsons of Mr. Macallister, remarkably fine boys; and Erskine treated them most kindly, and showed them all the curiosities in the vessel, causing even the guns to be fired for their amusement, besides filling their pockets with almonds and raisins. So that, with a handsome letter of apology, I hope we may erase any evil impression Mr. Macallister may adopt from our storming the exterior defences of his cavern.

## THE SEEDS OF PLANTS.

THE preservation of the various species of which the vegetable and animal kingdoms are composed, appears to be the special aim of nature in all her operations. To this end we find animals provided with such means of defence as are most suited to the necessities of the individual. Looking again at the vegetable kingdom, we see the same watchful Providence providing for the succession of vegetation, whether the object is food for man or beast, shelter from the heat of the sun, or the growth of timber for the purposes of building.

The seeds by which the objects of the vegetable kingdom are most usually propagated, are found of an infinite variety of forms, each adapted to the mode of growth, or the locality of the plant by which they are produced. Some are covered with a hard shell for protection, others are winged, so that they may be distributed by the wind, while another kind is projected with considerable force from the seed-pod when ripe. All seeds consist of one or more lobes, or *cotyledons*, protecting those parts which are destined to become the future plant.

The annexed engraving shows the growing seed of a common bean, with its mode of germinating. A is called the *plumule*, B the *radicle*. The latter, when the seed vegetates, directs its course downwards to form the root, the other rises through the ground to become a stem, branches, and leaves. But vegetation cannot take place unless the seed receives a due proportion of moisture, heat, and air, and this is one of the causes of the preservation of seeds; of this many singular facts are on record. In rooting up, some years ago, in the Garden of Plants at Paris, an old tree, the species of which could not be discovered, a circular trench was made by throwing up the earth to get at the roots. It was remarked, that in this earth there were several kinds of seeds, which were well preserved; they had, no doubt, been there since the time the hole in which the tree was placed had been filled up with the earth which contained them, where, away from the influence of sun and air, they had been unable to germinate. Being now again brought to the light of day, "they were sown, they germinated, their stems were developed, and they produced flowers and fruit." Frequently species of plants which have been long lost, have been recovered by digging deep in old botanical gardens.

But seeds which are not preserved in this accidental manner, are protected from injury in many ways. Some are furnished, as it were, with wings, and are capable of being wafted from place to place; the following are specimens:



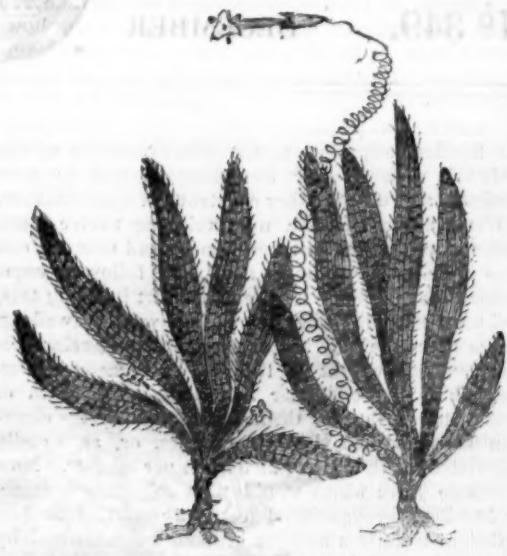
Fig. 1, the common thistle; fig. 2, the silphium marinum, an American plant, which grows on the sea-shore; fig. 3, the dandelion; fig. 4, the smooth cat's-ear; fig. 5, the wild clematis, or traveller's joy.

Another mode of distributing its seed occurs in the *Elaterium momordica*, or wild cucumber; upon the slightest touch, the capsule which contains the seed bursts, and the seeds are thrown out to the distance of a yard. The same thing takes place in the case of several species of fungi.



SEED-VESSEL OF WILD CUCUMBER EJECTING ITS SEED.

A very singular mode of reproduction occurs in the *Vallisneria spiralis*, an aquatic plant. This plant grows at the bottom of the water in running streams, and the flower of the male plant is fixed to a short stem, while that which produces the seed is attached to a



VALLISNERIA SPIRALIS.

spiral stem of great length, and generally remains at the bottom. When the blossom is ready to blow, it is detached from the stem, and, rising to the surface, expands and floats about,—at the same time the female blossom, attached to its long stem, rises to the surface, where it opens, and the seed is formed; as soon as this takes place the blossom closes, and again sinks to the bottom, where the seed is ripened.

MEN have entered into a desire of learning and knowledge sometimes upon a natural curiosity and inquisitive appetite; sometimes to entertain their minds with variety and delight; sometimes for ornament and reputation, and sometimes to enable them to obtain the victory of wit and contradiction, and sometimes for lucre and possession; but seldom sincerely to give a true account of their gift of reason for the benefit and use of man, as if there were sought in knowledge a couch whereupon to rest a searching and restless spirit, or a terrace for a wandering and variable mind, to walk up and down with a fair prospect, or a tower of state for a proud mind to raise itself upon, or a fort on commanding ground for strife or contention, or a shop for profit and sale, and not a rich storehouse for the glory of the Creator, and the relief of man's estate.—LORD BACON.

If I am asked who is the greatest man? I answer the best; and if I am required to say who is the best? I reply he that has deserved most of his fellow creatures. Whether we deserve better of mankind by the cultivation of letters, by obscure and inglorious attainments, by intellectual pursuits calculated rather to amuse than inform, than by strenuous exertions in speaking and acting, let those consider who bury themselves in studies unproductive of any benefit to their country or fellow-citizens. I think not.—SIR WILLIAM JONES.

It is by sympathy we enter into the concerns of others, that we are moved as they are moved, and are never suffered to be indifferent spectators of almost anything which men can do or suffer. For sympathy may be considered as a sort of substitution, by which we are put into the place of another man, and affected in many respects as he is affected.—BURKE.

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